subsequent to the step of compressing, preheating the destructured material in an environment of saturated steam; and

[without an intervening chemical digester, finally] immediately following the step of preheating, refining said material to form lignocellulose pulp.

31. (Amended) A method for producing thermo-mechanical pulp in a primary disc refiner from lignocellulose fiber-containing feed material comprising the steps of:

first conditioning said fiber containing feed material in an environment of steam at an elevated pressure in the range of [10-100] about 15-25 psi to produce a conditioned feed material at a temperature in the range of about 90-120 deg. C;

directly thereafter compressing said conditioned feed material in an environment of steam at an elevated pressure in the range of about [10-100] 15-25 psi to destructure said fibers at a temperature in the range of about 90-120 deg. C without significant breakage across grain boundaries;

preheating the destructured material in an environment of saturated steam at a pressure higher than the pressure of the environment at which the material was destructured; and

conveying the preheated material to the inlet of a primary disc refiner operating at a higher pressure than the pressure of the environment at which the material was destructured.

32. (Amended) The method of claim 27, wherein [said conditioning of said feed material is performed at a pressure in the range of about 15-25 psi and] said compression is performed in a compression screw device in the range of from 4:1 to 8:1 of the non-compressed volume of said conditioned feed material.

36. (Amended) A method for producing thermo-mechanical pulp in a primary disc refiner from lignocellulose fiber-containing feed material comprising the steps of:

first conditioning said fiber containing feed material in an environment of

saturated steam at an elevated pressure [in the range of 10-100 psi] to produce a conditioned feed material at a temperature in the range of about 90-120 deg. C;

directly thereafter compressing said conditioned feed material in an environment of saturated steam at an elevated pressure [in the range of about 10-100 psi] to destructure said fibers at a temperature in the range of about 90-120 deg. C without significant breakage across grain boundaries;

C3

preheating the destructured material in an environment of saturated steam at a pressure above the glass transition temperature of the lignin in the material, for a period of time less than 30 seconds;

conveying the preheated material to the inlet of a primary disc refiner operating at a temperature above the glass transition temperature of the lignin; and

refining the material at a disc speed of rotation that is greater than 1500 rpm for a double disc refiner or greater than 18000 rpm for a singe disc refiner.

REMARKS

As a result of the foregoing amendment, three independent claims 29, 31, and 36 are presented for reconsideration, along with dependent claims 2, 7, 23, 26, 27, 32, 33, 34, and 35 associated with claim 31 and dependent claims 24 and 37 associated with claim 36. Independent claim 30, drawn to a method for producing chemical pulp, has been canceled, as it was inadvertently carried over into the present Continued Prosecution Application.

The present application is directed only to a method for producing thermo-mechanical pulp (TMP). In this regard, each of the independent claims requires three distinct operations: (1) pretreatment by conditioning and compressing the feed material at particular environmental conditions, (2) preheating the pretreated material, and (3) refining the preheated material. These three distinct operations and examples of associated conditions are disclosed in the specification on page 3, line 25 (pretreatment at 90 -120 deg. C at 15-25 psi in conditioning component 3 and compressing component 8 of Fig. 1); page 12, line 5 (preheating at a temperature